

Draft OB7 Contents
April 26, 2005

- **Software Maintenance**
 - DRs from previous releases
 - *FSL (40), MDL (40), SEC (80), OHD (37)*
- **Radar**
 - Super-resolution 88D base products (SREC)
 - *Two new 8bit base products (Reflectivity and Velocity)*
 - *Resolution is 0.5 degree azimuth and 1/4km range for both*
 - *Maximum range is 460km for reflectivity and 230 km for velocity*
 - *Products available at the lowest 2 or 3 elevation scans (split cuts)*
 - *Like current approach for 4 bit and 8 bit base products, display as “best resolution” and specifically the existing 8bit products*
 - *Super-Resolution Storm Relative Velocity and VR shear will be provided*
 - Add products to TDWR SPG (STAT)*
 - *candidates are: composite reflectivity (CZ and/or ULR), VAD wind profile (VWP), Vertically Integrated Liquid (VIL)*
 - Mesocyclone Detection Algorithm (n/a)
 - *Retire the legacy mesocyclone algorithm when the new MDA is implemented*
 - *Begin central collection of the MD product*
 - *Modify NEXRAD Alerting so that the RPG provides alerts using MDA data instead of legacy mesocyclone data*
 - *Minor modifications to CZ and RCM product to use new MDA data instead of the legacy mesocyclone data*
 - Send environmental data from AWIPS to RPG (n/a)
 - *To support the mesocyclone algorithm, add a capability for AWIPS to send Near Storm Environment data to RPG. Provide three dimensional temperature, dew point, and wind data from within about 200 nmi of the radar site, at an hourly update rate*
- **Model data**
 - NOGAPS (OB6 SREC)
 - *The Fleet Numerical Meteorology and Oceanography Center (FNMOC) Navy Operational Global Atmospheric Prediction System (NOGAPS) guidance products are required to support operations at CONUS and OCONUS WFOs with marine and tropical responsibility. These products are now routinely made available from the FNMOC as backup for the Global Forecast System guidance products (GFS) on AWIPS and NAWIPS. In addition to being used as backup, the NOGAPS data are also required for routine support to the operational forecasters at WFOs which are responsible for issuance of marine forecast products and warnings. These data are required over the North and South Atlantic and Pacific Oceans.*
 - *Horizontal resolution: T239 (~0.5 degree on the Gaussian grid)*

Draft OB7 Contents

April 26, 2005

- *Vertical levels: 30 sigma levels with approximately 6 sigma levels below 850 mb, depending on terrain elevation*
- *Forecast time: 144 h from the 00Z, 06Z, 12Z and 18Z ops run is 0.5 degree resolution (~60km), 144 hours.*
- *Parameters required from NOGAPS:*
 - *300 hPa Heights and Isotachs*
 - *500 hPa Heights and Relative Vorticity*
 - *700 hPa Heights, Relative Humidity, Vertical Velocity*
 - *850 hPa Temperature, Winds, and Relative Humidity*
 - *1000-500 Thickness and Sea Level Pressure*
 - *Surface Wind Speed and Direction*
- *These products are required for display in the AWIPS D2D application, and also for initialization of gridded wind and wave forecasts in IFPS.*
- **FNMOC Wave Watch Model Guidance (OB6 SREC)**
 - *The Fleet Numerical Meteorology and Oceanography Center (FNMOC) Wave Watch III guidance products are required to support operations at CONUS and OCONUS WFOs with marine and tropical responsibility. These products are now routinely made available from the FNMOC as backup for the Global Forecast System guidance products (GFS) on AWIPS and NAWIPS. In addition to being used as backup, the FNMOC Wave Watch III guidance data are also required for routine support to the operational forecasters at WFOs which are responsible for issuance of marine forecast products and warnings. These data are required over the North and South Atlantic and Pacific Oceans. Parameters required from FNMOC Wave Watch III:*
 - *Significant Wave Height*
 - *Wind Wave Height*
 - *Primary Swell Height and Direction*
 - *Secondary Swell Height and Direction*
 - *Surface Wind Speed and Direction*
- **GFS BUFR Sounding Data (OB6 SREC)**
 - *Forecast Intervals*
 - *Every three hours out to 168 hours for all four cycles, giving 56 total "valid times:"*
 - *00, 03, 06, 09, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72, 75, 78, 81, 84, 87, 90, 93, 96, 99, 102, 105, 108, 111, 114, 117, 120, 123, 126, 129, 132, 135, 138, 141, 144, 147, 150, 153, 156, 159, 162, 165, and 168 Hrs.*
 - *Units are hours from model initialization time.*
 - *The four GFS model run times are 00, 06, 12 & 18 UTC.*
 - *Vertical levels: Same vertical levels as ETA BUFR soundings*
 - *Stations: All available GFS stations*
 - *Retention period: At least two GFS model runs.*

Draft OB7 Contents

April 26, 2005

- *AWIPS Display: In D2D in the Skew-T log P view, Regional and States scale (RFC will see sounding from RFC scale)*
- All 12 km Eta products, CONUS & AK, upgraded to 10 km from North American Mesoscale WRF (SREC)
 - *Note: NCEP planning on 12km (re-validate requirement)*
 - *Will require phasing out of 12km ETA*
- Full suite of SREF products for CONUS and Alaska (SREC)
 - *Short Range Ensemble products*
 - *Full suite for CONUS and AK*
 - *~24 km resolution with ~20 members*
 - *very small number of fields from each member but full set of means, spreads and various event probabilities.*
 - *Alaska SREF proposed (Still need regional input)*
 - *Mean & Spread -- Surface*
 - *10m wind (u & v), 2 m temp, 2 m dew point, sea-level pressure*
 - *Mean & Spread -- Upper Levels*
 - *Height 500mb 250mb -- we can add 1000mb, 850mb, 700mb, 300mb*
 - *RH 850mb 700mb -- we can add 1000mb, 500mb, 300mb? and 250mb?*
 - *Temp 850mb 700mb -- we can add 1000mb, 500mb, 300mb, 250mb*
 - *Thickness 1000-850 850-700 1000-500*
 - *Threshold parameter - probabilities*
 - *pcpn 3, 6, 12, 24hr - GE .01, .25, .5, 1., 2. -- we can add .05, .1 and 1.5*
 - *12hr snowfall GE .01, 4, 8, 12, 16 -- we can add 1, 2, 6, 24*
 - *prob of precip -- rain , freezing and snow -- we also have dominant pcp type*
 - *CAPE GE 500, 1000, 2000, 3000, 4000*
 - *LI GE 0, -4, -8 -- we can add -2 and -6*
 - *sfc wind GE 25kt, 34kt, 50kt -- we can change 50kt to 48kt if necessary*
- ECMWF model (SREC)*
 - *European Centre for Medium-Range Weather Forecast (ECMWF) products are available within AWIPS (Table 1) via the GTS. In summary, these products are available at two run times (0Z and 12Z) and at 24 hour forecast intervals from 0 to 168 hours, for five atmospheric profile parameters at a very limited number of levels, as well as for PMSL.*

Draft OB7 Contents

April 26, 2005

- *Currently a limited set of GRIB1-format ECMWF that is provided twice daily to AWIPS via the TG/NCF/SBN (00UTC and 12UTC)*
- *Office of Climate, Weather, and Water Services (OCWWS) conducted a field review in 2002-03 through regional focal points and technical representatives, developing requirements for an expanded product list (Table 2). We request an increase to four run times (0Z, 6Z, 12Z, and 18Z), an increase in vertical resolution to 15 levels for four of the atmospheric profile parameters (10 levels for RH), as well as an additional eleven parameters (all single-level except Vertical Velocity at 7 levels).*
- *The format would be the same as the pre-existing ECMWF grids (GRIB1) and so we would continue to use the existing (GRIB1) decoder*
- RUC 13km (SREC)
 - *All 20 km RUC products upgraded to 13 km*
 - *Assimilation of new observations*
 - *GPS precipitable water, METAR cloud/vis current weather, MESONET and 915 boundary-layer profiles, RASS temps*
 - *Model changes*
 - *Mixed-phase cloud microphysics*
 - *Grell-Devenyi convective parameterization for improved icing and convection forecasts*
 - *Remove RUC 20km grids in OB7.x*
- **Satellite**
 - Polar Microwave Products (SREC)*
 - *Polar Sounding Products from microwave sounders include:*
 - *Total Precipitable Water, rainfall rate, soil moisture, surface type and soil wetness index*
 - *The Total Precipitable Water (TPW) products can be used to monitor available moisture over otherwise data sparse region (Atlantic and Pacific Oceans). This data can also be used in NWP model assessment.*
 - *The surface wind product can complement the limited ship and buoy reports in oceanic areas (and the Great Lakes). This data is critical for marine warning and forecast products. The rain rate products allow NWS forecasters to assess the amount of precipitation that a storm is producing before it is within range of the NWS radar network.*
 - *The soil moisture product is very important in flood and flash flood products since it indicates precursor soil conditions that have a great impact on floods and flash floods. It is desirable to have the SSM/I and AMSU products available separately so that they can be used to raise confidence in the microwave products (i.e., if both show similar values, a forecaster is more likely to feel comfortable using the products). Having SSM/I and AMSU separate also offers better temporal sampling.*

Draft OB7 Contents

April 26, 2005

- **Hydrology**

- Operational Implementation of Distributed Hydrologic Modeling (SREC)
 - *The first component of the several components needed to fully integrate distributed hydrologic modeling capabilities into the NWSRFS is planned for OB7. That component is the central grid computation engine that will implement the Sacramento Soil Moisture Accounting model calculations on an HRAP grid for selected basins in an RFC domain. Various existing computational engine architectures from the USDA (Modular Modeling System), the National Operational Hydrologic Remote Sensing Center (SNODAS), and others are examined for usability*
- WHFS HydroView Enhancement to Replace “Mapper” (SREC)
 - *Hydromet4 and its predecessors have served the NWS very well over the past 25 plus years. Faced with operating system, hardware, and software support issues, the Western Region of NOAA’s NWS has been attempting to phase out the Hydromet4 for several years.*
 - *Operationally essential Hydromet 4 functionality which must be provided by other systems/programs can be classified into three basic groups: (1) data collection, (2) point data display (tables and graphs), and (3) spatial data display (maps). Recently, affordable private sector solutions that fully meet the data collection requirements have been identified and are being tested in several WFOs and RFCs. Point data display within WHFS HydroView was prototyped from and exceeds the capability of Hydromet4 and is therefore not an issue. Spatial data display, available through the Hydromet4 Mapper program remains the sole unmet operational requirement. Spatial display of point data is available through WHFS Hydroview, but it lacks the operational functionality available through Hydromet4 Mapper. RFC and WFO staff who have used the Hydromet4 Mapper program for years are extremely resistant to losing this key operational tool.*
 - *The key attributes that set the Mapper program apart from existing, nationally supported programs are (1) speed, and (2) ease of use. The Mapper program is capable of displaying data for a variety of observed data elements and periods quickly and with a minimum of user selections and mouse clicks. The difference is in large part due to the architecture of the data resource. Mapper relies on a pre-built data file generated at user definable intervals while WHFS Hydroview re-queries the relational database each time new data or a new time period is requested. Mapper also provides for a single click direct relational database access to individual station data. WHFS Hydroview has a great deal of flexibility not available in Mapper, but that flexibility comes at the expense of speed and required user selections*
- Integrate CHPS Data Services for RRS (n/a)

Draft OB7 Contents

April 26, 2005

- *Implementing the Community Hydrologic Prediction System (CHPS) data architecture into the NWSRFS is the first step to migrating the NWSRFS off a custom host file database and onto the IHFS Database. The basic Data Services components of CHPS have been prototyped against on of the NWSRFS data pre-processors, the River, Reservoir, & Snow (RRS) data pre-processor. This task is to “operationalize” those components of the Data Service so that the RRS can get its observation data using the Data Service and can choose to get data from the older host file database or the IHFS Database. Most of this work is being paid for by AHPS with AWIPS effort only needed to integrate into the baseline and support NGIT testing*
- Integration of RFC QPE tools into a common National System (STAT)
 - *Implement the ABRFC originated "P3" precipitation field generation methods and interactive quality control methods into the MPE (Multi-Sensor Precipitation Estimator) suite of applications. Introduce integration of components of the Western Region DailyQC gage precipitation quality control and processing methods into MPE.*
- **Decision Assistance**
 - 4D Storm Cell Investigator (n/a)
 - *Integrate National Severe Storms Laboratory (NSSL) Warning Decision Support System – Integrated Information (WDSSII) 3D/4D display technology into AWIPS*
 - *FSI will be an extension to D2D*
 - *Provide for quick and easy access to the data (15-30 seconds per storm)*
 - *Provide linkages between 2D representations and 3D data*
 - *Still difficult for users to overcome tendency to view in traditional 2D manner*
 - *Radar data must be “native” 8-bit resolution polar grids*
 - *Z, V, SRM, SW*
 - *4D: Animation while slicing and dicing*
 - *GUI should have similar look and feel to D2D*
 - *Keyboard shortcuts*
 - SCAN Enhancements (SREC)
 - *Auto-nowcaster short-term convective forecast application*
 - *The AutoNowcaster is a complete experimental system developed by NCAR that provides reflectivity forecasts for up to 60 minutes. Initial step is to provide some interaction between AWIPS and the still-separate AutoNowcaster. This first step will allow the user to define boundaries in AWIPS, send them to the AutoNowcaster, and display several of the AutoNowcaster’s output field in the D2D.*
 - FFMP Enhancements (STAT)

Draft OB7 Contents

April 26, 2005

- *Gridded precipitation*
 - *FFMP will be able to use both the DHR radar product and a pre-defined precipitation grid as precipitation sources. This will allow the user to choose between the traditional, radar-based FFMP and the new Grid-based (potentially multi-radar and multi-sensor) FFMP*
- **Guardian (STAT)**
 - *Guardian is a piece of software designed to communicate from software to user. It will run on each workstation and provide a very flexible configuration, which will allow the user to decide how they want to be told about various issues. Specifically, this will eventually eliminate all of those unwanted red banner pop-ups and will also assume the placement of the monitor buttons that currently exist below the WarnGen button in the D2D. If Alpha Testing goes well, this will be an OB7 deliverable.*
- **System for Nowcasting Of Winter Weather (SNOW) (STAT)**
 - *This new application will detect hazardous winter weather conditions, such as blizzards and freezing rain. The backbone of it will be an observation point monitor and tabular display (similar to SAFESEAS), but there will also be algorithm output using other data sources (such as model and/or radar).*
- **SAFESEAS**
 - *Rip Current product (STAT)*
 - *MDL is working with OCCWS to design a rip current monitoring capability through SAFESEAS. The application will ingest near-shore buoy observations and tidal gage water level data, and this data will be used along with the bathymetry plots and rip current algorithms to detect (and possibly forecast) high-risk areas for rip currents. This is a prototyping effort for the OB7 time frame.*
 - *Fog Monitor (OB6 SREC)*
 - *Include point observation in the Fog Monitor*
 - *Add MAROBS to data type list (OB6 SREC)*
 - *MDL is working with OCCWS to add MAROBS data to its list of available data types (joining METARS, VOS ship observations, buoy reports, and Mesonet observations). Also requested are additional wind and pressure parameters for the SAFESEAS table*
- **Aviation**
 - **Aviation Forecast Preparation System (AVNFPS)**
 - *Forecasters at National Weather Service (NWS) Weather Forecast Offices (WFO) prepare and disseminate Terminal Aerodrome Forecasts (TAF) and Transcribed WEather Broadcasts (TWEB) operationally. The Aviation Forecast Preparation System (AvnFPS) assists forecasters in these tasks.*

Draft OB7 Contents

April 26, 2005

- *AvnFPS assists the forecaster in maintaining a weather watch by comparing the latest observations with the current forecasts and alerting the forecaster to any discrepancies. AvnFPS provides product preparation interfaces that are tailored to the preparation of aviation forecasts. The application also performs a quality control assessment of the forecasts before they are issued and manages the submission of TAF and TWEB products to communication circuits. AvnFPS also monitors a variety of guidance sources, including grids created by the Interactive Forecast Preparation System (IFPS), numerical weather prediction output, conditional climatology, and other sources.*
- **GFE**
 - Develop and incorporation of a new Universal Formatter (UFOR) for CRS (SREC)
 - *Phase I: NWRWAVES (NOAA Weather Radio With All-hazards VTEC Enhanced Software is being developed by a CR team to ultimately replace CAFÉ and support CRS product generation requirements that exist in WWA. Addresses many of the UFOR white paper requirements.*
 - *NPG is a tcl/tk script and runs off database triggers*
 - *Uses VTEC coding to define product type and expiration*
 - *Flexibility for different types of WA that may be issued with the same PIL*
 - *GUI for product/event configuration*
 - *Creates summary messages*
 - *Will produce product for any product, even without a UGC*
 - *Transmitter specific*
 - *Separate utility program to assist focal points modify/update the CRS ASCII database file*
 - GFE/GHG Infrastructure
 - *Performance Improvements*
 - *Analyze the various subsystems within GFESuite for performance bottlenecks and correct them by redesign and/or reimplementation. Specific systems that are candidates are the ISC Processing, Multi-Threaded ifpServer, Improved Text Formatter Sampling Techniques.*
 - *Test Plans*
 - *Bring the written test plans up-to-date. Automate additional test scenarios using the flexible iTools infrastructure. Testing with iTools can execute various scenarios quickly and flag errors by creating data sets, running them through the formatters, and examining the formatter output for expected results.*
 - *iTool Development*

Draft OB7 Contents

April 26, 2005

- *iTools is a powerful concept for GFESuite. We are currently using it for testing; however, its use could significantly improve overall system performance. Currently forecasters run "brute-force" tools on the grids whether the grid needs to be modified or not. With iTools properly developed and configured, iTools can be used to automatically generate consistent grids as other grids are being changed. For example, currently the forecaster must run scripts to ensure T, Td, and RH are all consistent. With iTools, if a forecaster changes a T grid, the corresponding RH grid is automatically changed. Less CPU load plus more consistent database.*
- *Intersite Coordination*
 - *Intersite Coordination techniques use a significant amount of CPU processing due to the mosaicking process. This task looks at methods to avoid mosaicking incoming grids to keep them as separate data sets. Upon display of the grids, the mosaicking operation is done as a display mosaic. Benefits are reduced CPU usage and thus higher performance, at the cost of additional disk space.*
- *ifpServer data structures*
 - *The ifpServer data structure currently in use is very complicated. As a result of attempting to save disk space a couple of years ago, significant software bugs were introduced into the software. These bugs cause database corruption and loss of forecast gridded data. The data structure and lower-layer handling of storage and retrieval of gridded data need to be redesigned and overhauled.*
- *text formatter sampling performance*
 - *Text formatters take too much time to run. Performance analysis has shown that much of the time is in the data sampling and the repeated conversion from C++ to Python of these large data structures. Redesign and reimplementing of this section of the text formatter infrastructure is required to greatly improve the performance of the formatters.*
- *Multi-threaded ifpServer*
 - *Large data blocks written or read from the ifpServer (e.g., 100s of grids) can significantly delay other clients from accessing the ifpServer. This is due to the fact that the ifpServer is single-threaded and so is the RPC communications protocol. Preliminary experiments have shown that it may be possible to multi-thread the ifpServer communications layer to increase throughput (i.e., reduce GFE pauses). It will take additional time to begin the multi-thread the ifpServer to allow concurrent transactions to occur. This will likely be an ongoing process that could take a significant time to completely multithread, and thus at some point in the development we will need to assess what is "good enough".*

Draft OB7 Contents
April 26, 2005

- **Grid Initialization***
 - *Forecasters at WFOs use a variety of sources for initialization of gridded forecast elements. These gridded forecast elements are prepared in the Interactive Forecast Preparation System (IFPS) Graphical Forecast Editor (GFE). Under present practices, the forecasters interactively select the guidance or data to be used for initialization of these grids. After grid editing, forecast collaboration and quality checks, the products are published. These gridded forecast products are provided as graphics and grids to customers via local dissemination means and via the National Digital Forecast Database (NDFD) as experimental and official products. At times high priority WFO Operations activities interrupt the routine preparation of gridded forecasts, and forecasters are unable to meet established deadlines for gridded product initialization and generation. During these cases, forecasters are occasionally unable to initialize gridded data for some the forecast periods prior to deadlines. This may result in gridded products with missing forecast values. To avoid dissemination of gridded products with missing values, there is a need to provide a mechanism to automatically initialize the grids for the forecast period of day 1 to 8 with a user configurable selection of data initialization sources. GFE Requirements for WFO forecaster capabilities for default initialization for gridded elements required for the day 1 to 8 forecast period:*
 - *Provide a Graphical User Interface (GUI) to set grid element initialization*
 - *Provide a mechanism to allow forecasters to select whether they will manually initialize or automatically initialize grid elements based upon user defined schedule*
 - *Provide capabilities for manual modification of initialization options within the GUI*
 - *Provide capabilities to automatically initialize grids with user definable options*
 - *Initialize any user selected forecast grid element available within GFE*
 - *Select any user defined source for initialization*
 - *Select any user defined period for initialization from day 1 to 8*
 - *Provide capabilities to select both primary and secondary sources of guidance to use for initialization*
 - *Provide capabilities for evaluation of completeness of primary and secondary guidance data sources*
 - *Provide mechanism to check to ensure guidance source is complete prior to initialization*

Draft OB7 Contents

April 26, 2005

- *Provide mechanism for checking to ensure that if the primary data source is not available or is incomplete, the secondary data source is used for initialization*
- Add the capability to use NCDC climatological data in GFE for display, smart tools, and formatters (SREC)*
- OPC and TAFB Offshore Gridded Significant Wave Height forecasts in D2D and IFPS/GFE display, smart tools and formatters (STAT) *
 - *The Ocean Prediction Center (OPC) and the Tropical Analysis Branch (TAFB) of the Tropical Prediction Center (TPC) will prepare gridded forecasts over the Coastal Waters, Offshore and High Seas marine zones. The Coastal Waters marine zones extend out 20 to 60 nautical miles off the U.S. Coastline. The Offshore and High Seas marine zones extend seaward from the Coastal Zones over the North and South Atlantic, North and South Pacific, the Gulf of Mexico and the Caribbean.*
 - *Today OPC and TAFB prepare graphics for surface based marine parameters such as Significant Wave Height, Wind Speed and Direction, Sea Level Pressure, Wave Swell Height and Direction, and Weather. These centers are expected to transition to preparation of gridded products for these and additional marine parameters. These products will be disseminated in AWIPS via the SBN.*
 - *These products will be used by WFO marine forecasters as forecast guidance. These guidance products are intended to serve as a source of initialization of WFO generated marine forecasts in IFPS. WFOs will use these guidance grids with the Intersite Coordination Tools in IFPS to ensure marine forecasts from WFOs are spatially and temporally consistent with those generated from OPC and TAFB.*
- **NDFD**
 - NDFD grid subsectors for RFCs via AWIPS (SREC)
 - *NWS RFCs can download CONUS grids off the NDFD central server. However, a more efficient method of downloading NDFD grids can be accomplished through a preprocessor that will ingest temperature grids, compute areal averages for river basins, find element values at points, and output time series of areal averages and point values in formats compatible with the NWS River Forecast System (NWSRFS) and external user applications.*
 - *To improve this effort, special NDFD sectors can be designed for download to RFCs via the AWIPS WAN. These sectors simply define grid points (every 5km) within or just beyond a RFC forecast domain. With the growing need for several gridded forecast elements in the NDFD, RFCs will use these high resolution grids for display in AWIPS D2D and ingest to the NWSRFS every six hours. A total of 13 RFC sectors, including Alaska, will be made available.*

Draft OB7 Contents
April 26, 2005

- Extend geographic domain of NDFD products to cover Offshore and High Seas domain (STAT)
 - *The Ocean Prediction Center (OPC) and the Tropical Analysis Branch (TAFB) of the Tropical Prediction Center (TPC) will prepare gridded forecasts over the Offshore and High Seas marine zones. WFO Anchorage, Alaska will prepare gridded forecasts over the Offshore marine zone. WFO Honolulu will prepare gridded forecasts over the Offshore and High Seas marine zones. The Offshore and High Seas marine zones extend over the North and South Atlantic, North and South Pacific, the Gulf of Mexico and the Caribbean.*
 - *Today OPC and TAFB prepare graphics over the Offshore and High Seas domains for surface based marine parameters such as Significant Wave Height, Wind Speed and Direction, Sea Level Pressure, Wave Swell Height and Direction, and Weather. These centers are expected to transition to preparation of gridded products for these and additional marine parameters. WFO Anchorage and Honolulu will prepare gridded products over the Offshore domains. WFO Honolulu will also prepare gridded products over the High Seas domain. These marine products over Offshore and High Seas marine zones will be disseminated to customers via the NDFD.*
- New NDFD elements
 - *Add TPC's Gridded Probabilistic Winds and OPC and TAFB Offshore Gridded Significant Wave Height Forecasts (STAT)*
- Analysis of Record (STAT)
 - *NWS operational forecasters, at both WFOs (Weather Forecast Offices) and NWS National Centers, need high-resolution, objective, real-time gridded analyses of hydrometeorological parameters (e.g., temperature, dew-point temperature, wind, and clouds). A set of high-spatial and high-temporal analyses would enhance the quality of the NDFD (National Digital Forecast Database) generation by providing valuable information supporting warnings, forecasts and forecast verification. Further, this capability would improve the overall quality of products and services supporting the NWS mission.*
 - *The AOR (Analysis of Record) is a set of high-resolution, real-time gridded analyses of hydrometeorological parameters. These parameters would include, but are not limited to, temperature, dew-point temperature, wind, and clouds and would support the NWS mission at field offices and the production of the NDFD. These analyses can be used as both an operational and research tool. For example, the AOR would be helpful in the development of mesoscale, numerical models to provide enhancements in forecasting and, in the study of various, meteorological, mesoscale and climatological phenomena. Additionally, the AOR can provide*

Draft OB7 Contents

April 26, 2005

researchers and NWS customers with an enhanced climatological database. The AOR is included as a need in the 2005 NWS Service Improvement Plan (NSIP).

- The RTMA (Real-Time Mesoscale Analysis) is a prototype, proof-of-concept effort that is being developed by NCEP's EMC (Environmental Modeling Center). Early developments have commenced and test analyses should be available this fiscal year. EMC will produce this AOR prototype that initially will deliver real-time analyses of variables on a 5-km NDFD matching CONUS-scale grid. These analyses will initially be made available hourly for NWS operational meteorologists through regional WAN distribution. Ideally, the distribution will transition to the SBN as quickly as possible.*
- For OB 7 AWIPS software will be modified to ingest and display the RTMA information. This information will be in GRIB2 format and distributed through the NWSTG, SBN, and to AWIPS sites. The GRIB2 data would be converted to the NetCDF format for display in D2D. The goal is to provide test data from EMC into AWIPS by August 2005 and products provided to AWIPS sites full time in 2007. The inclusion of this functionality in OB7 will also facilitate development of additional capability beyond OB7, such as the use of these analyses by the GFE in IFPS.*

- **Infrastructure**

- COTS Upgrades
 - *Includes updates to gcc compiler and Postgres*
- Convert RFC Archiver Databases & Software to PostgreSQL
 - *Informix V9.3 is incompatible with the RHEL 3.0u4 operating system which is desired for all AWIPS systems for OB6. This incompatibility was discovered too late for OB6 so needs to be addressed in OB7. Upgrading to Informix 9.4 is cost prohibitive for AWIPS. Mainly, the work is to convert the RAX database and all software that accesses it at the RFCs from Informix to PostgreSQL*
- GRIB2 Decoder (MDL to NCEP)
 - *Replace the current GRIB2 decoder developed by MDL with the NCEP GRIB2 decoder.*
- Removing local data access on NAS
 - *Move "tmp", "raw", "bad" directories of NAS, keep them local*
 - *Use opportunity to put "raw" and "bad" into a uniform directory structure and rename directories*
 - *Maintenance and performance issue*
- Improve installation times

Draft OB7 Contents

April 26, 2005

- *Analyze where time is spent during installations over last four OB releases*
- *Target biggest opportunities for improvement*
- *Include pre and Post install steps*
- *Objective reduction - 25% reduction in installation times*
- *Threshold reduction - 15% reduction in installation times*
- Develop prototype data distribution method
 - *Simplify and improve methods of delivering data.*
 - *Delivery of data is limited by SBN bandwidth and process*
 - *Only a small percentage of data is used at any one time*
 - *Provide a mechanism for accessing data not delivered directly over the SBN in a manner that is transparent to the user that uses "Data Pull" technology*
 - *Benefit will be having access to data that isn't resident locally... freeing sites from the tyranny of data/fxa.*
 - *Objective: Have prototype installed in at least one WFO and RFC in OB7 timeframe*
- Modify architecture to allow more frequent release
 - *Look for opportunities to eliminate dependencies of other software or standardize interfaces so that more software can be released as applications. This will improve the ability to distribute software quicker to the field*
- Displaced Real Time (preliminary work via OISP)*
 - *Provide integrated playback and simulation capabilities for all AWIPS functionality*
- Decommission DS
 - *Remove remaining software of the DS and decommission the hardware*
 - *Items remaining on the DS include LDAD, Radar applications and the Dail-out Radar*
- Decommission WWA
 - *Remove WWA and update integration points with IFPS*
- Transfer Maintenance responsibilities to maintenance organizations
 - *Allows for more effort to be spent of strategic items*
 - *Software to be transferred in OB7 timeframe*
 - *GFE Support,*
 - *IFPS,*
 - *HWR,*
 - *Climate,*
 - *LSR,*
 - *Radar Display**

Draft OB7 Contents
April 26, 2005

- *Communications,*
- Directive Changes
 - *Address Directive changes identified and prioritized by OCWWS personnel. Current, no directive changes have been identified for OB7.*

Draft OB7 Contents
April 26, 2005

Table 1 - Current ECMWF Products in AWIPS

At 0Z and 12Z for 8 Forecast Times (0, 24, 48, 72, 96, 120, 144, and 168 hours)

<u>Parameter</u>	<u>Levels</u>
Geopotential Height	500 mb
Temperature	850 mb
Relative Humidity	850 and 700 mb
Wind (u)	850, 700, 500, and 200 mb
Wind (v)	850, 700, 500, and 200 mb
Mean Sea Level Pressure	Surface

¹additional Geopotential Heights at 700 mb for 168 hours at 0Z and 12Z, and at 500 mb for 240 hours at 0Z

Draft OB7 Contents
April 26, 2005

**Table 2 - Northern Hemisphere Requirements for
European Centre for Medium-Range Weather Forecast
(ECMWF) Products for AWIPS**

	Cycles/ Day	Levels	** Time Steps *** On Hour Off Hour		Notes
Height	4	15	36	32	1,2,3
Temperature	4	15	36	32	1,2,3
Relative Humidity	4	10	36	32	2,3,4
Wind (u)	4	15	36	32	1,2,3
Wind (v)	4	15	36	32	1,2,3
Vertical Velocity	4	7	36	32	2,3,5
5-Wave 500mb	4	1	36	32	2,3
Tropopause Pressure	4	1	36	32	2,3
Tropopause Wind (u)	4	1	36	32	2,3
Tropopause Wind (v)	4	1	36	32	2,3
Mean Sea Level Pressure	4	1	36	32	2,3
Precipitable Water	4	1	36	32	2,3
Lifted Index	4	1	36	32	2,3
CAPE	4	1	36	32	2,3
CIN	4	1	36	32	2,3
Accumulated Precipitation	4	1	35	31	6,7
Convective Precipitation	4	1	35	31	6,7

Notes:

1. H, T, u, & v Levels (15) - (SFC, 1000, 950, 900, 850, 800, 700, 600, 500, 400, 300, 250, 200, 150, and 100 mb)
2. On Hour (0Z & 12Z) Forecasts - 0 to 192 hours at 6 hour increments, and 204 to 240 hours at 12 hr increments
3. Off Hour (6Z & 18Z) Forecasts - 0 to 192 hours at 6 hour increments
4. Relative Humidity Levels (10) - (SFC, 1000, 950, 900, 850, 800, 700, 500, 400, and 300 mb)
5. Vertical Velocity Levels (7) - (950, 900, 850, 700, 500, 300, and 200 mb)
6. On Hour Forecasts for precipitation - 6 to 192 hours at 6 hour increments, and 204 to 240 hrs at 12 hr increments
7. Off Hour Forecasts for precipitation - 6 to 192 hours at 6 hour increments